Successful Methods

A Magazine of Construction Service

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S. T. HENRY, President — WILLIAM JABINE, Secretary and Editorial Director
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Coming into Their Own

BACK in the summer of 1906 a crude, awkward, cumbersome steam locomotive crane was used for various operations in building an intercepting sewer in Grand Rapids, Mich. That may not have been the first extensive use of a locomotive crane on a construction job. Anyway, it was enough of an innovation to call for a feature story in one of the two leading engineering papers of that time.

That is less than 20 years ago. For some years after that locomotive cranes were not common on construction jobs. In fact, the general application of them to field operations is due largely to the need for shifty, portable units for handling the enormous quantities of materials required in modern roadbuilding. The experience gained in that business was quickly adapted to other lines of work.

Along with this development came a complete change in crane design. The heavy, crude machines have rapidly been replaced by speedy units of improved design and workmanship. Steam power also has largely been replaced by gas engines. Flanged-wheel and traction-wheel mountings have mostly given way to continuous-tread trucks; even motor truck mountings are becoming common. Operating speeds have likewise been greatly increased. In short the chief resemblance of the locomotive crane of today to the machine of 20 years ago is in its name.

As swiftly as these changes in use and design have occurred, the possibilities seem to have by no means been exhausted. Certainly, only a fraction of the potential users now own cranes. Concerns versed in their use also are constantly extending the operations they handle with cranes. At the same time, there is still room for much mechanical improvement, and particularly in the use of higher grade materials. The latter would reduce breakdowns, and also permit still higher operating speeds with the same power.

With the foregoing in mind, it seems reasonable to expect for a long time to come a continuation of the rapid expansion in the use of locomotive cranes on construction work. This type of equipment has apparently only just well started toward coming into its own.

Combination Haulage

THE combination of motor trucks and industrial railway haulage on concrete road construction jobs is deservedly being widely used. This combination for some years has been employed effectively in various parts of the country. Last season, however, reports indicate that a good many more concerns adopted this idea than in any one previous year. The indications also are that 1926 will see an even more general adoption of this method of delivering road materials.

Advocates of the use of motor trucks to the exclusion of all other methods of transportation are common among road builders. It also is easy to find many who are just as ardent advocates of industrial railway haulage. Certain conditions do favor motor trucks over any other means. Other conditions have produced the industrial railway enthusiasts. There is a vast number of jobs, however, on which there are some conditions favorable and unfavorable to both trucks and light railways. Usually this is where the combination idea fits in best. But even on jobs that appear to be just about right for trucks a little study shows the advantage of the combination.

By using trucks to haul over finished work, it is possible to reduce the amount of track required for the industrial haulage to a minimum. At the same time, the track spans the gap of recently completed work, thus avoiding the construction and maintenance of detours for the trucks. The track also enables deliveries to be made directly to the mixer without any hauling over the subgrade. This not only cuts out expensive hand shaping up, but means that work can continue with minimum delay during a rainy day.

Probably the chief reason why the combination haul idea is spreading so fast is the ease with which the transfer from the motor truck to the rail cars can now be made. Batch boxes designed specially for this use are easily and quickly shifted. Various set-ups for making this shift have been used to advantage.

Terminal and route conditions vary so widely that no generalization in regard to haulage is possible. There are such practical advantages to combination haulage in so many cases, however, that few concrete road builders can afford to pass up this idea without the most careful study of it.

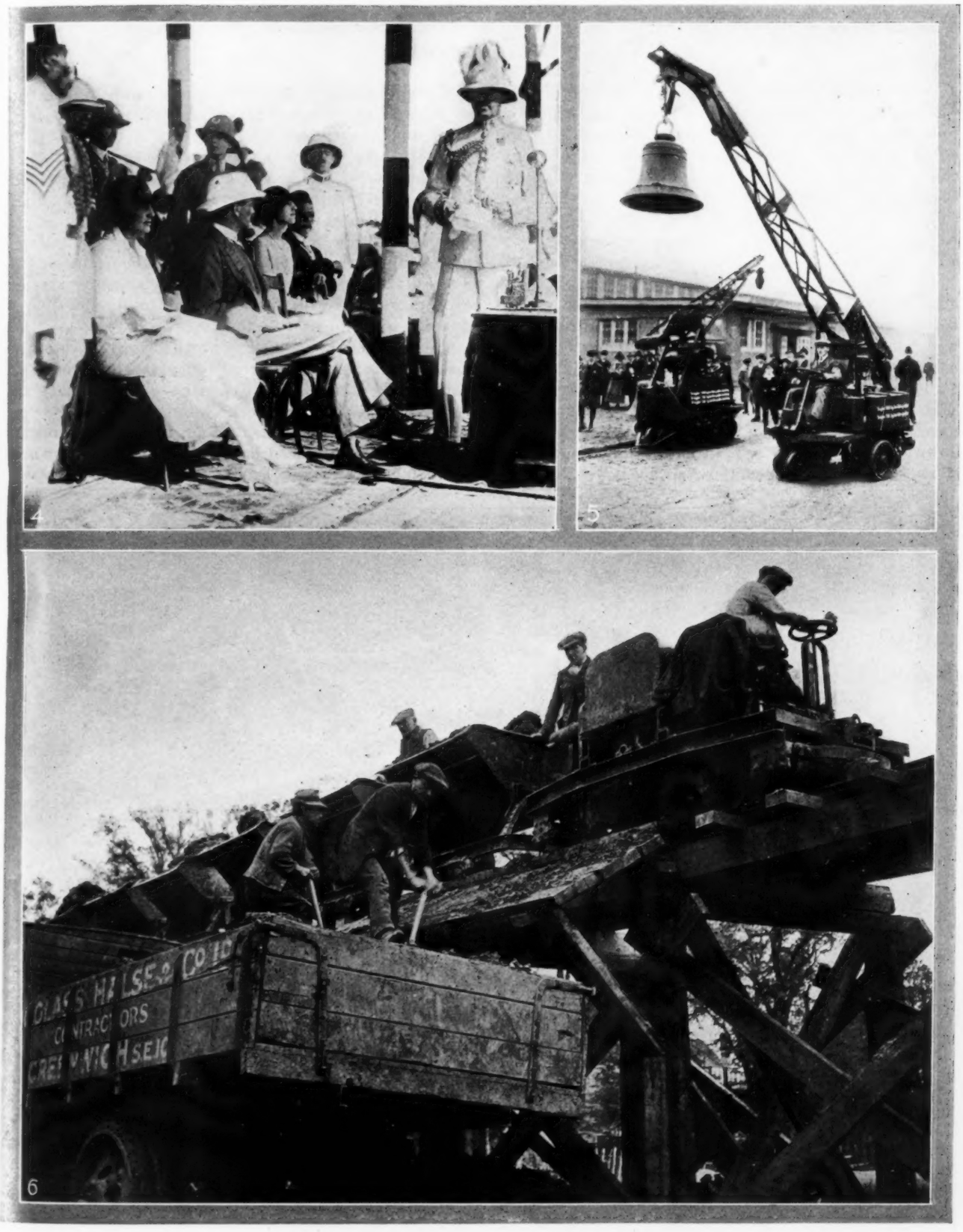
Are You Proud of Your Work?

MANY of the articles which appear in the columns of SUCCESSFUL METHODS are sent in by readers. This magazine welcomes such contributions and it is hoped that their number will be greatly increased during the 1926 construction season, which is now beginning throughout the United States. If you are proud of the job you are doing, let your fellow constructors know about it.

Construction Scenes

1. The workmen who are removing the statue of Richard Morris Hunt from the roof of the Vanderbilt mansion in New York handled the effigy of the famous architect with tenderness and respect. © *International.*
2. Horse drawn graders digging an irrigation canal in Australia. © *P. & A. Photos.*
3. The flags of all nations decorated the first trainload of earth dumped on the site of the Olympic Games of 1928 in Amsterdam. © *P. & A. Photos.*

From Many Lands



1. Sir Geoffrey Archer and Lord Lloyd opened the Sennar Dam in Egypt with elaborate ceremonies. © *P. & A. Photos.*
5. A baby crane shown at the Leipzig fair in Germany. © *International.*
6. Industrial haulage in use on a roadbuilding job in England. © *P. & A. Photos.*

ELIMINATING A FINISHING PROBLEM

Steel Caps Over Expansion Joints Make It Possible to Do Away with Cumbersome Methods

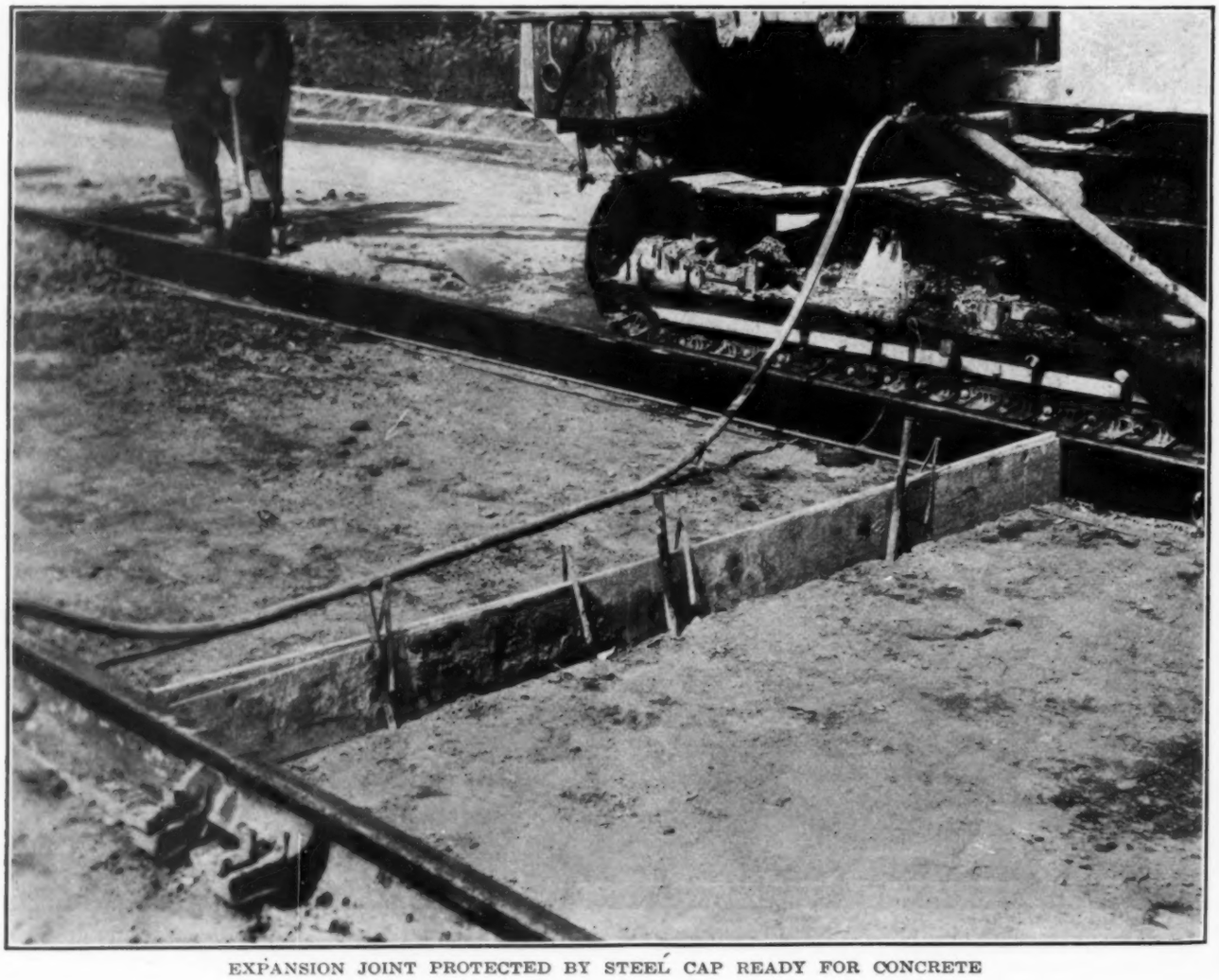
By T. W. Dieckmann

ONE of the problems frequently encountered in using a finishing machine is its operation on jobs where expansion joints are encountered at frequent intervals. How such a condition can be successfully overcome and even a better joint obtained than by the old methods was demonstrated last season by the Wood & Wolcott Co. of Buffalo, N. Y., who were building the State highway between Vakatue and Schodack Centre, N. Y.

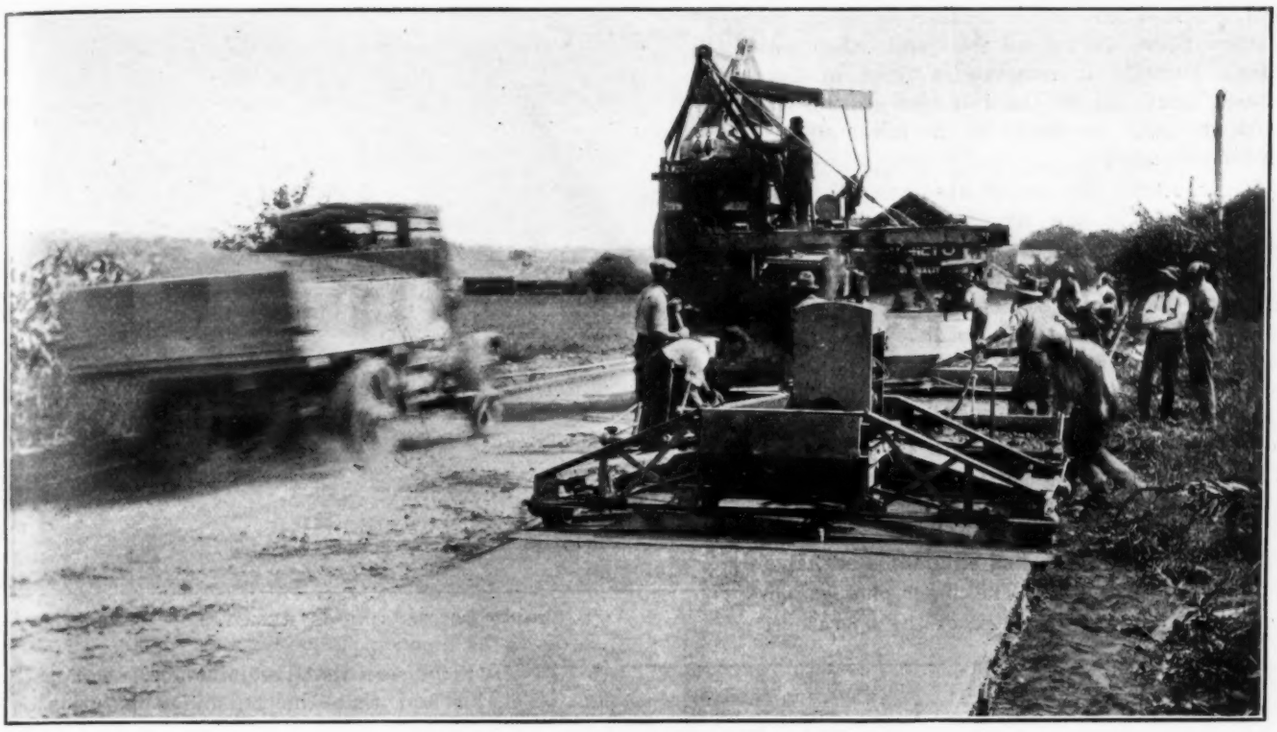
The specifications for a large portion of the work on which the contractors were using a Lakewood finishing machine called for pre-molded joints which were placed transversely every 40 ft. The old method used for this work was to run the finisher up as close as possible to the joint then lift the strike-off, or screed member and run the machine ahead until this member cleared the joint material and then set it down again and proceed with the finishing operations. The slab immediately adjacent to the joint was then finished with a split float from a bridge, but at best it was difficult to get a job which was free from any unevenness.

In order to eliminate this condition and to facilitate the use of the finishing machine it was decided to use steel caps on the pre-molded joint material. These steel caps were made of eighteen gage metal U-shaped with a depth of about 2 in. and wide enough to fit snugly over the ½-in. joint material. These caps were placed over the top of the joint material and the concrete immediately adjacent to the joint was finished over flush with it.

This method of using the finisher is illustrated in the photographs, which accompany this article. The photograph at the bottom of page 4 shows the joint material in place against the bulkhead ready for the concrete. The cap is in place on this joint material. Concrete is then placed on each side of the joint and the bulkhead removed, leaving the steel cap in place.



EXPANSION JOINT PROTECTED BY STEEL CAP READY FOR CONCRETE

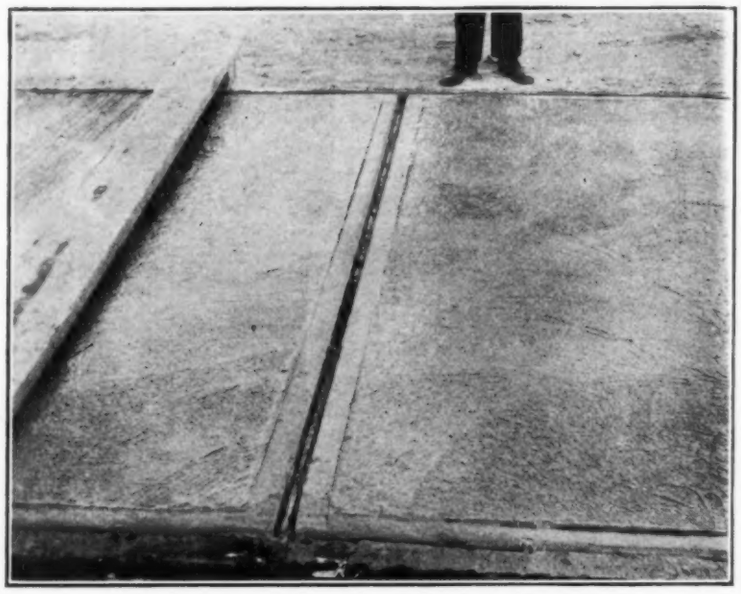


FINISHING OPERATION IS CONTINUOUS

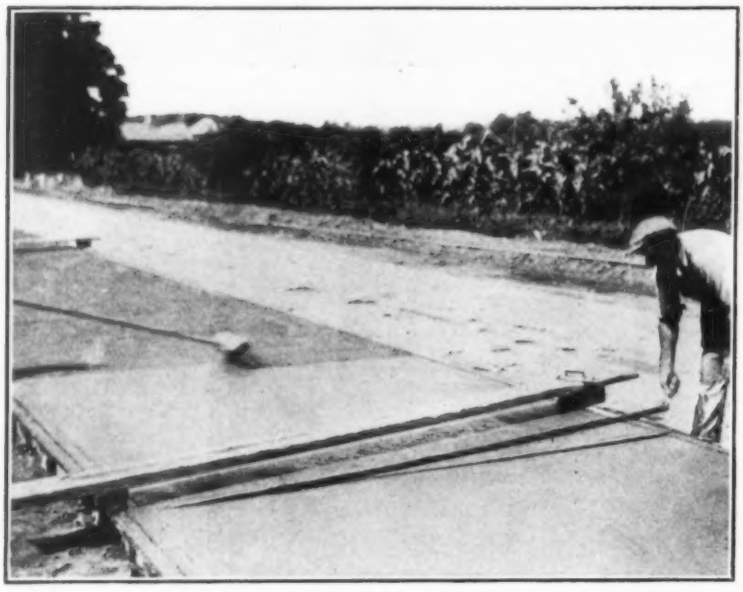
THE FINISHING MACHINE WORKS TO WITHIN 18 INCHES OF JOINT

The screed machine or finisher works up to within about 18 in. of the joint when all excess concrete is removed in front of the screed board and the concrete leveled off even with the joint, as shown in the lower photograph on page 5.

The machine then moves ahead and for the first time over the screed board is lifted slightly as the joint is reached and lowered again on to the forms when the front edge of this screed board has passed over the joint. This precaution is taken so that if by any chance the joint material has been left slightly high, the screed will set it in place exactly flush with the pavement surface. With the second trip over with the screed or finisher, the screed board is carried across the joint without being lifted from the forms. This insures the joint being finished to the exact level of the slab and eliminates all hand floating at this point. The upper photograph on page 5 shows this stage of the operation.



JOINT AFTER CAP IS REMOVED



JOINT IS EDGED ALONG STEEL CAP

It will be seen that the joint does not appear at all and that the finishing operation is continuous.

When the concrete is set sufficiently for edging, the joint is edged along the steel cap, which is then removed, as shown in the left-hand photograph on this page. The edges are then touched up, leaving a joint, as shown in the upper photograph.

This method has resulted not only in an easier operation for the contractor but has produced a better looking and better riding transverse joint.

Tom Shaunnessy is the Superintendent for the Wood and Wolcott Co. on this job.

This method also has been tried out with slight modifications on other state highway jobs in New York, and wherever it has been tried it has proved economical and thoroughly satisfactory. It will most likely be universally adopted in New York State.

DETROIT ENGINEERS SEEK TO IMPROVE QUALITY OF CONCRETE

FOR the last year or two the Detroit Engineering Society has been at work on the problem of improving the general quality of concrete going into structures in Detroit. A committee of the Society has been at work on the problem since 1924 and has succeeded in obtaining the cooperation of contractors, producers of aggregates and others concerned in the production of concrete. A report was recently issued by this Committee setting forth the results of the research which had been done and recommending that certain specifications be followed in future work.

In order to bring these specifications to the attention of those interested in construction work, the Detroit Engineering Society is holding a series of evening meetings at which the design and control of concrete mixtures and the water-cement ratio theory are being thoroughly discussed.

The Committee's report stated that the principal causes of defective concrete were found to be: 1. Insufficient time of mixing; 2, Excessive quantity of mixing water; 3,Improper character of concrete aggregates, and 4, Inadequate protection during curing in not or cold weather. The new specifications are so planned that if they are followed these defects can be eliminated. The efforts of the Society to improve the quality of concrete have been duly acknowledged by Frank Burton, Commissioner of Buildings and Safety Engineering.

PROPERLY DESIGNED EQUIPMENT SOLVES WASTE DISPOSAL PROBLEM IN DETROIT

Six Thirty Yard Air Dump Cars Replace Forty Ordinary Cars and Handle Job Far More Efficiently

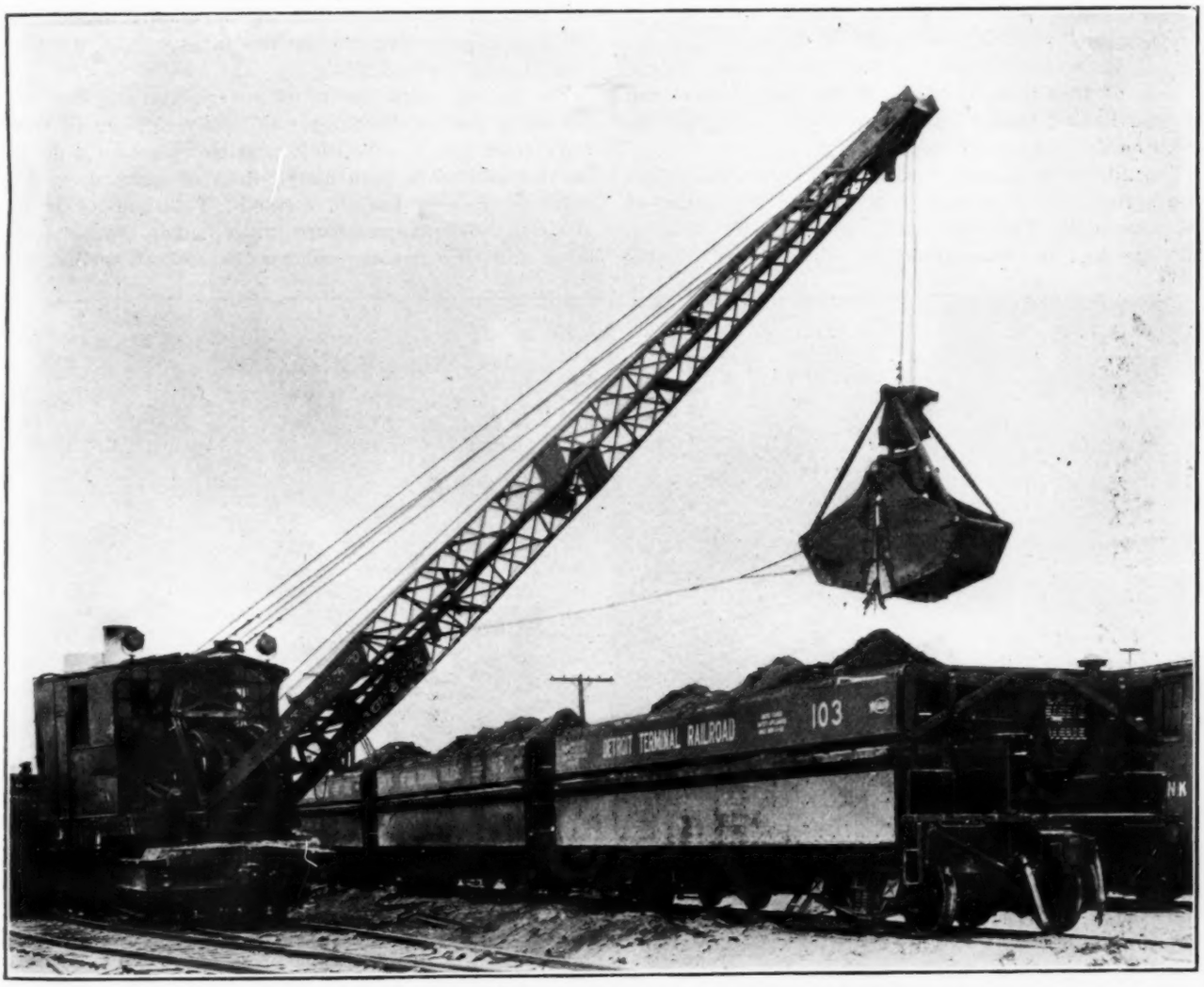
By C. P. Burton

THE economical disposition of boiler house cinders and factory waste is a problem that grows more and more complicated with the increasing expansion of industry. It may be of interest and help for others similarly situated to know how the problem has been met and solved in the Detroit manufacturing district where many of the great automobile industries that have revolutionized modern life are concentrated.

The problem of cinder disposal there has not been perplexing, as all the cinders that can be produced are salable locally at $1.25 to $1.75 a cu. yd. The disposal of the great accumulations of burnt out molding sand from the huge foundries is a different matter.

The Detroit Terminal Railroad undertook to handle this waste sand of the industrial concerns, furnishing the cars and charging a switching fee for the service. The Detroit Terminal Railroad, as the name implies, is a switching railroad. It has nineteen and a half miles of main line track and 126 miles of industrial service track in the city of Detroit. This terminal railroad is owned jointly by the New York Central and Grand Trunk Railroads, and subsidiary lines.

The sand, taken in this way from the various industries, was used by the railroad company for making needed fills along the line and in the terminal yards, for widening the road bed, etc. Forty 45-yd. railroad cars usually were tied up in this work, which involved so many expenses and delays that last year the rail-



LOADING AIR DUMP CARS WITH WASTE FROM DETROIT FACTORIES

road company decided to install automatic air dump cars instead of taking railroad cars out of traffic.

Six 30-yd. air dump cars of the Western type were purchased and these six cars have been taking the place of the forty railroad cars. The air dump cars are of the type built especially for railroad service, being provided with steel aprons that automatically act to extend the floors as the cars are dumped, thus throwing the load beyond the ties.

The method of procedure is for the various industries served by the railroad to notify the company whenever there is an accumulation of sand or other waste to be removed, informing the company at the same time the approximate amount of such accumulation. One or more dump cars, as may be needed to handle the situation, are sent to the factory in question and there loaded by a clamshell bucket and crane. The loaded cars are then run out on the line, wherever the material is needed for the railroad purposes, and dumped.

The use of air dump cars has been found to have many advantages over that of railroad cars for taking care of this waste material. One problem involved in the use of railroad cars is now avoided entirely. The tracks of this switching railroad in the busy city of Detroit are so congested with traffic that it was difficult to secure the use of a main line track long enough to unload the train of waste. These tracks are never clear more than ten minutes at a time. The practice was to unload as much of the material as possible and then run the train into the clear and wait for the approaching freight train to pass. The material train would then go back and finish unloading if possible; if not go into the clear again as before. The locomotives of the railroad company handle from 90 to 100 cars each and it costs money to start and stop such trains, to say nothing about the cost of delaying traffic. With a train of air dump cars, which are dumped automatically by air to either side instantly, it is possible to run out on the main line track, dump a load and get away again inside of five minutes.

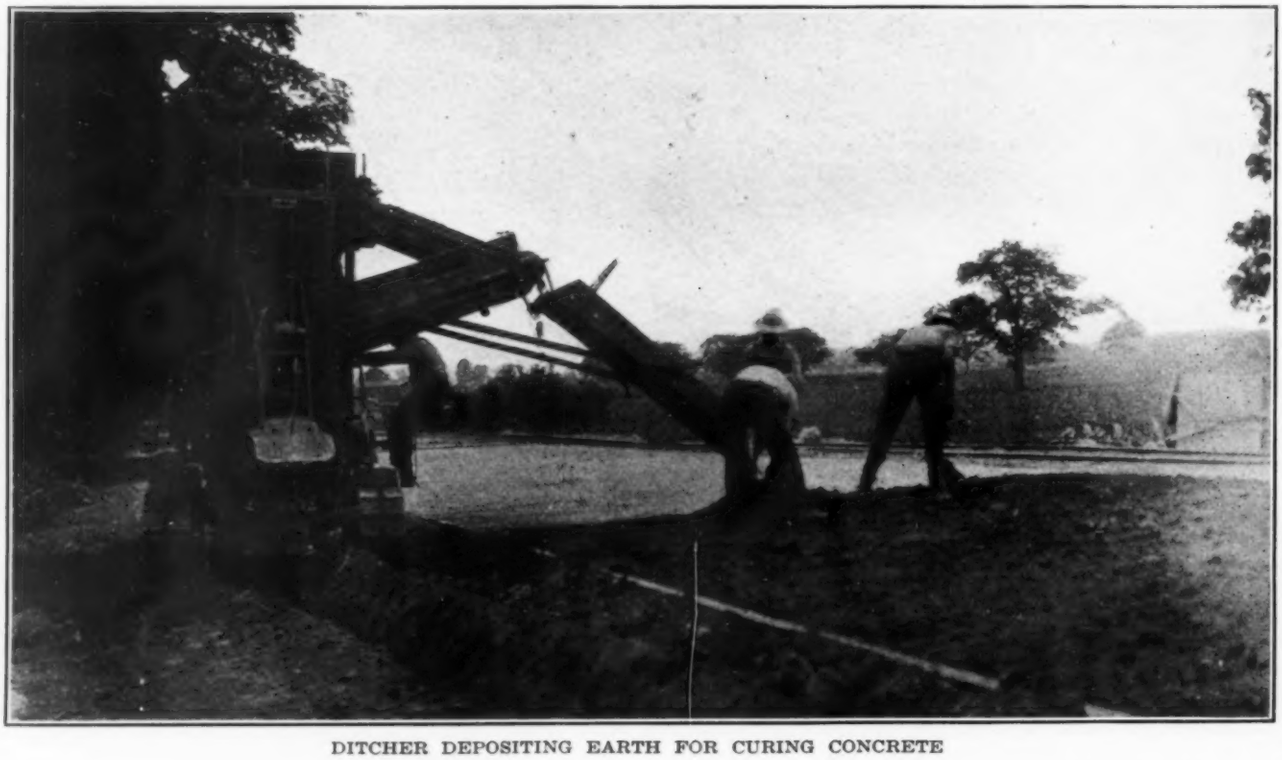
DITCHER DIGS EARTH FOR CURING CONCRETE

ONE of the best known road contractors in the United States is G. P. Scharl of Grand Rapids, Michigan, and when he works out a new way of handling any part of a road job it is worthy of the most serious consideration. The photograph at the bottom of this page shows how Mr. Scharl has been using a Barber Greene ditcher to obtain and place the earth needed for curing newly laid concrete.

The ditcher is equipped with a conveyor and extension sprout, which deposits the earth in the center of the pavement. Two men with shovels follow close behind the machine and spread the earth evenly over the entire surface of the newly laid concrete pavement.

The machine is set to cut a shallow ditch, and when the work is finished a blade grader is run over it to fill it up again. If the ground is especially hard a plow is used for backfilling.

The use of a ditcher for this work has enabled Mr. Scharl to reduce the number of men employed in this work from 6 to 3. It also is possible to obtain a much heavier and more even distribution of earth over the concrete than by the old method. This heavier layer of earth holds the moisture much longer than a thin layer and thus greatly reduces the cost of sprinkling.



DITCHER DEPOSITING EARTH FOR CURING CONCRETE

Tin Hats and Gas Masks

1. Trench helmets protect the workmen building a dam in the State of Washington. © *International.*
2. A London navvy wearing a gas mask in an excavation. © *Keystone.*
3. Gas masks also were necessary in applying chemicals to the surface of this tennis court in California. © *P. & A.*

MODERN CONCRETE BUILDINGS IN PERU

New Structures in Lima Built by Foundation Company Are Credit to City

JUST a year ago an article in this magazine described the roadbuilding phase of the work that the Foundation Company is doing in Peru under the terms of a contract with the Peruvian Government. That article stated that the Foundation Company's Peruvian activities were by no means confined to highway work, and the photographs on this and the opposite page are visible proofs of that statement.

They show two buildings which have been constructed in Lima by the Foundation Company, one to house the Ministerio de Fomento, or Department of Public Works of the Peruvian Government, and the other for W. R. Grace & Company. Both structures are built of reinforced concrete. Local materials were used, even the cement being manufactured locally, the Foundation Company having taken over and reconstructed a cement mill formerly operated by a Peruvian company.

THIS BUILDING HOUSES THE MINISTERIO DE FOMENTO

The new building for the Ministerio de Fomento was begun in July, 1924, and was formally opened with official ceremonies attended by President Leguia last October. While it was still under construction it was used as part of the exposition arranged to celebrate the centennial of the battle of Ayacucho. The building contains three floors, two above ground and one below the surface. It is

THE MINISTERIO DE FOMENTO BUILDING UNDER CONSTRUCTION

elaborately finished inside, all of the trim and fittings being brought from the United States.

The building is situated in the grounds of the Zoological Park and faces on the Avenue of the Twenty-Eighth of July. As may be seen from the photographs, the ground plan of the building is shaped like the letter H. The building will have a total frontage of 60 meters and a depth of 57 meters. The wings are 14.20 meters in width so that the connecting portion has a frontage of approximately 30 meters.

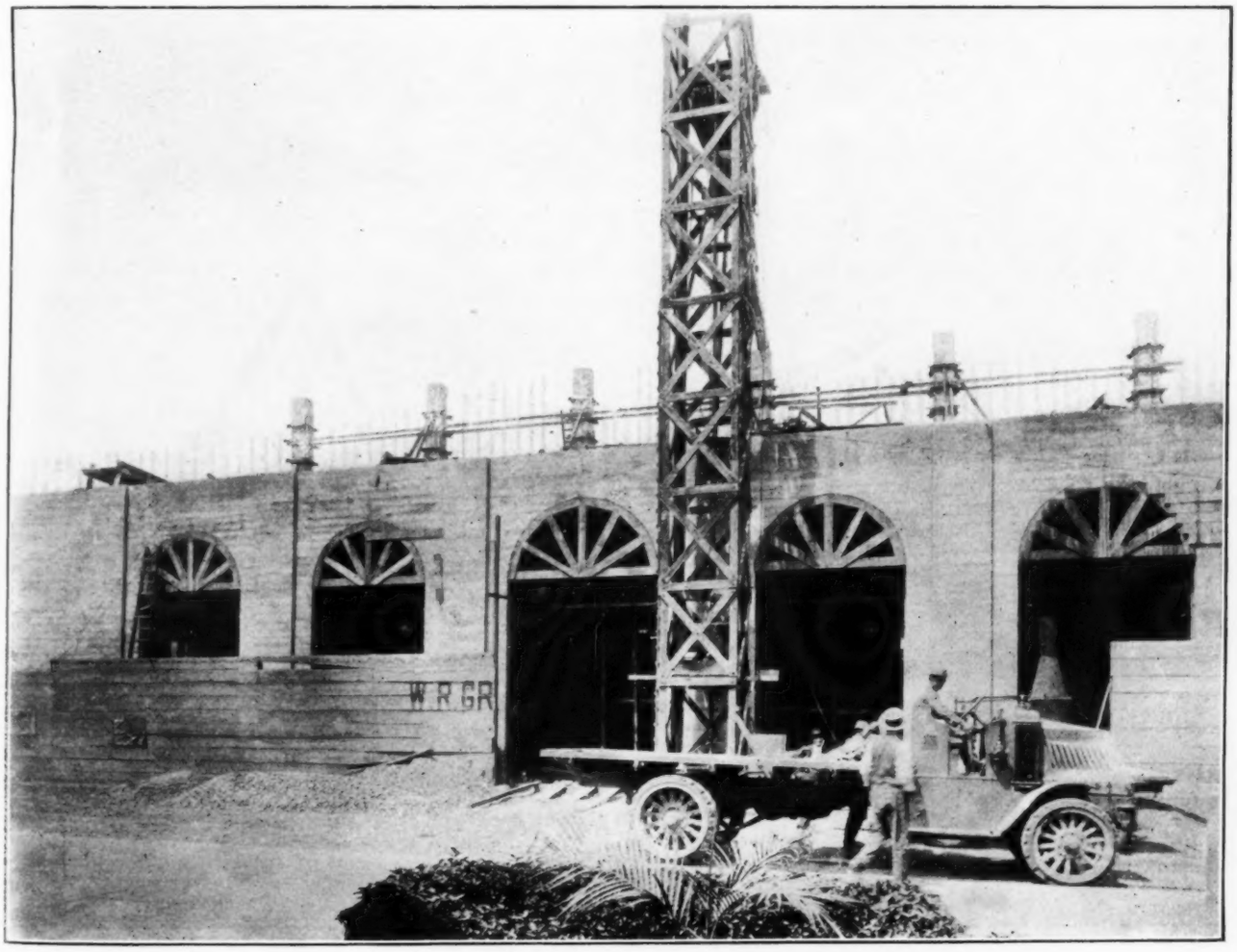
STRUCTURE BUILT FOR W. R. GRACE & CO.

The cost of the Ministerio De Fomento building has been defrayed by the tolls collected on the new highway between Lima and Callao known as the Avenida Progreso. At the time the building was started in July, 1924, Manuel G. Masias was in charge of the Department of Public Works. Later he was succeeded by Dr. D. Pedro Jose Rada y Gamio, who is still at the head of the department and made the main address at the official opening ceremony.

The Grace building was begun in March of last year and is just about finished. It is a two-story structure of impressive appearance and will be occupied by the general offices of W. R. Grace & Co. in Peru.

These two jobs, one public and the other private, help to add to the variety of work that the Foundation Company is doing in Peru. The contract with the Peruvian Government includes not only road and building construction but the installation of modern sanitation and water works systems in various cities.

In addition the company is now engaged in the restoration of the famous old fort, Real Felipe, at the Port of Callao. This fort, which, as its name indicates, was built in the days when the Spanish ruled Peru, has been used for various utilitarian purposes for a great many years. It is now being restored as nearly as possible to its former state.



THE GRACE BUILDING HALF WAY UP

TRAVELING DERRICK HANDLES CONCRETE ON TEXAS DAM

Flat Car Mounting Provides Mobile Equipment for Work

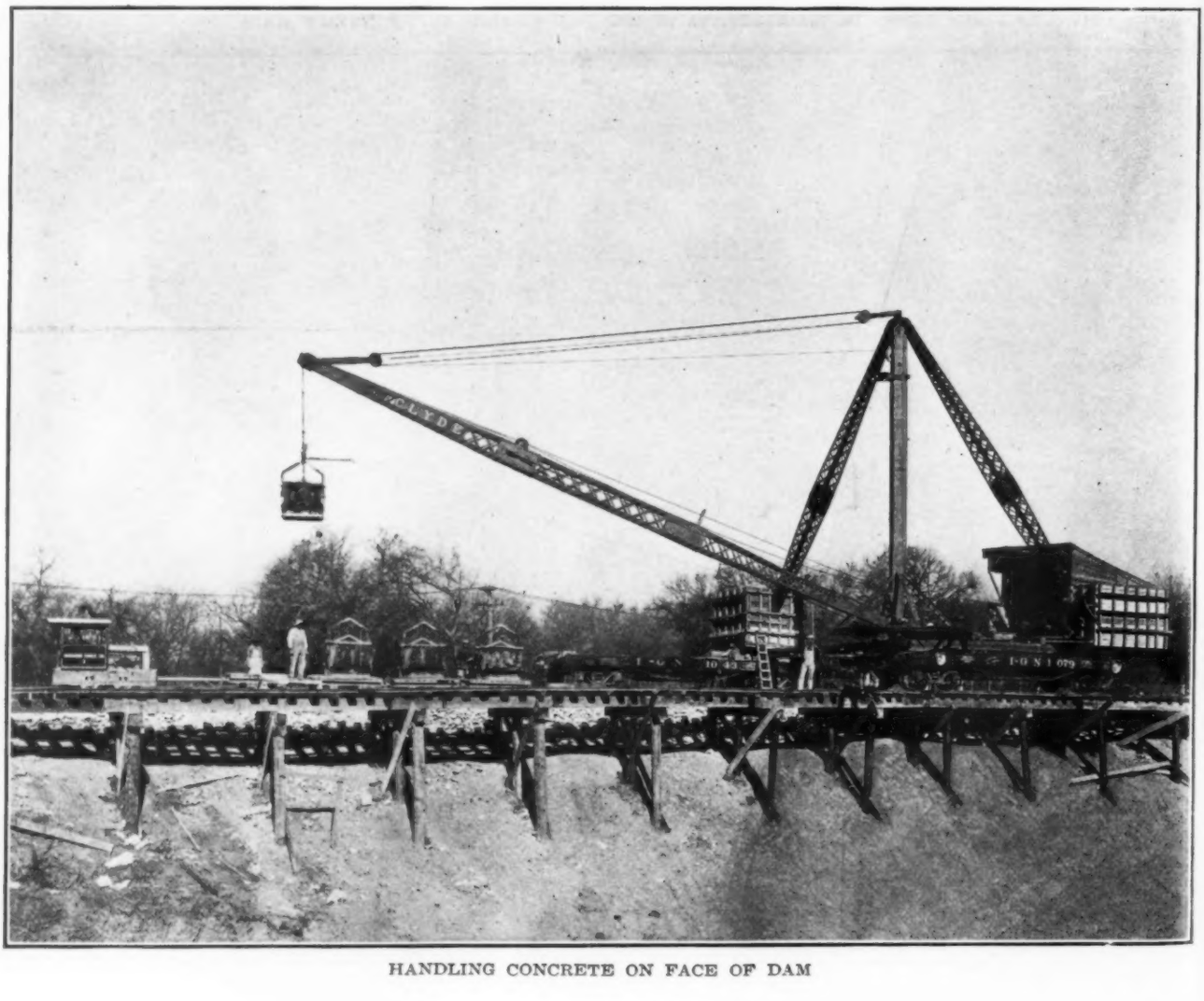
IN building the Olmos Dam in San Antonio, Texas, the McKenzie Construction Company, general contractors of that city, have organized an unusual and exceedingly efficient construction plant. The concrete is placed by a big Clyde derrick mounted on two flat cars which travel back and forth along the face of the dam and can be moved a thousand feet in a few minutes.

The dam is of the concrete gravity type and is being constructed across the valley of Olmos Creek just above the city of San Antonio for detention purposes only. There are six large sluice gates to pass all water that may fall upon the Olmos watershed as long as the river channel through the city can carry the water. There will be no water impounded behind the dam except for short periods of time when the river channel cannot carry off all the run-off.

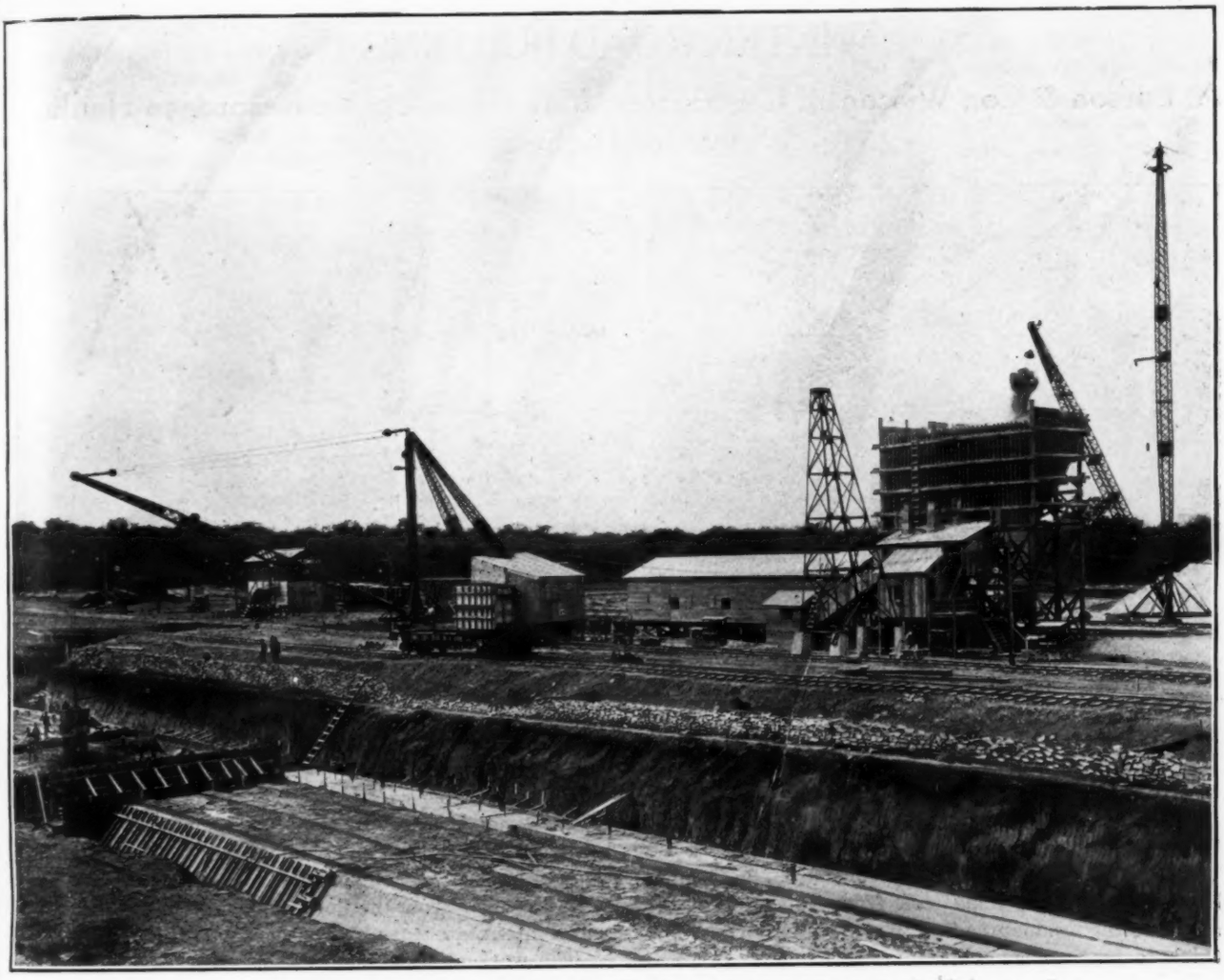
The concrete is mixed in a central mixing plant, the aggregates for which are supplied from overhead bins, which are kept filled from the cars or storage pile by a Clyde stiff-leg derrick with a 100 ft. boom and 20 ft. full wheel operating a 1½-cu. yd. clamshell bucket. This derrick and mixing plant are shown in the photograph on the cover of this issue of SUCCESSFUL METHODS.

The McKenzie organization is mixing and placing on an average of 500 cu. yd. of concrete a day, which requires about 750 cu. yd. of aggregate. This means that the guy derrick is worked on two 8-hr. shifts. The derrick is handled by an 80 hp. three drum Clyde electric hoist with bull wheel swinging gear attached.

Cement is unloaded from cars along the side of the cement shed adjoining the plant by gravity conveyors and elevated to the mixer hopper by means of a belt conveyor. The concrete is mixed in a 1½-cu. yd. tilting drum mixer and discharged into 1½-cu. yd. bottom dump concrete buckets. These buckets of concrete are transported to place of delivery on Lakewood industrial



HANDLING CONCRETE ON FACE OF DAM



MIXING PLANT AT RIGHT, TRAVELING DERRICK AT LEFT

cars running on 24-in. gage track in trains of three cars each, drawn by 3½-ton gasoline locomotives.

There are three of these trains and practically all the time the derrick is waiting on the trains, although this will be changed to some extent when the top of the dam is reached. Then the buckets cannot be dumped so quickly as they are now in the broad base. However, it is doubtful if it could be done except with a first class operator, especially on the short hauls when the derrick is working near the mixer. The traveling derrick is a 5-ton capacity stiff leg derrick with 70-ft. boom and 14 ft. bull wheel and is operated by another Clyde electric hoist with 60 hp. motor and swinging gear attached.

The concrete distribution is made by the Clyde stiff leg derrick mounted on two flat cars which travel the full length of the dam. This derrick picks up the concrete bucket from off the industrial cars and dumps it into the forms.

Wood forms are being used up to within 18 ft. of the top of the dam and a traveling steel form will be used for the top 18 ft.

IOWA HAS EXTENSIVE ROAD PROGRAM

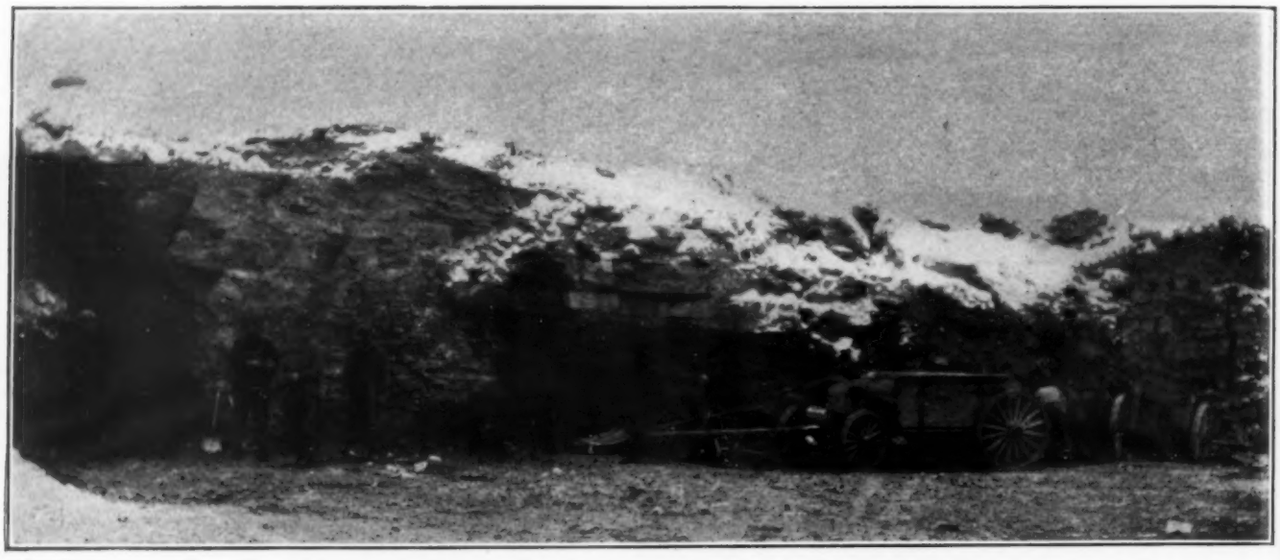
IOWA is planning to spend almost $10,000,000 for road construction during 1926. The State Highway Department's construction program calls for 521 miles of grading at a cost of $6,991,308; 704 miles of gravel road to cost $2,329,800, and 23 miles of paving costing $673,000.

The construction figures for 1925 show that 330 miles of road were graded, 286 miles of gravel road built and 62 miles of paving laid. When the construction season ended work was still under way on 67 projects. This was due largely to the fact that very unfavorable weather during the fall months handicapped the contractors at work on the State highways. There were practically no delays because of lack of materials or delays in transportation.

The work carried over consisted of 22 miles of paving, 62 miles of gravelling and 110 miles of grading. In addition, there were 243 bridges and culverts in various parts of the State still under construction when work was stopped for the winter.

WINTER ROAD BUILDING

A. Larson & Co., Wisconsin Contractors, Make Remarkable Records in Hauling Shale for Highways



DURING the winter which has just ended, A. Larson & Company, general contractors of Eau Claire, Wisconsin, have been carrying on the construction of two important highway projects between Black River Falls and Merrillan and between Sparta and Tomah, Wisconsin. This work consists of getting out large quantities of shale rock from the adjacent hills and hauling and spreading it on the highway 9 in. thick to an average width of 18 ft.

It is necessary to break all the shale up to a size 4 in. to 6 in. in the pit so that it can be properly rolled and leveled up in the spring of the year, after which it will be covered with a thin layer of fine torpedo gravel. This work has been carried on primarily to give considerable winter employment to farm labor and teams and also to hasten the completion of these projects for the early summer traffic of 1926. Unusual difficulties have been met and overcome and the several crews working on the jobs under their foremen and superintendents have produced remarkable results.

The work at Merrillan was begun by Isaac Isaacson and is now being carried on and finished under the supervision of W. H. Bluedown as superintendent and Eric Larson as pit foreman. The work at Tomah is

ORDINARY LOADS, GOOD SLEIGHING CONDITIONS. THE UPPER PHOTOGRAPH SHOWS THE MERRILLAN SHALE PIT

being carried on under the supervision of Vic Isaacson as superintendent and Martin Isaacson, shovel foreman. On account of the character of the hills from which the shale is removed, it proved necessary to handle the two jobs in distinctly different methods.

The shale pit at Merrillan, Wisconsin, is situated on a high, steep hill about 1½ miles from the main traveled road. The shale in this pit is first loosened by shooting with dynamite and then broken up with picks and sledges and shoveled into the dump wagons by hand labor. It is then hauled to a large trap over a double track gravity incline railway and dumped directly into the tramway cars. When a car is filled, the hoist brake is released and the loaded car runs down the tramway, pulling the empty car back up the hill on the other track. This operation is alternately repeated each time a car is loaded and descends rapidly to the bins at the foot of the hill.

GRAVITY TRAMWAY AND BINS

The material is then dumped from the bins into the waiting sleighs and hauled from there directly to the road. As many as twenty teams have been employed in one day in hauling this shale away from the bins. A record run of 307½ cu. yd. of shale has been made in one day. In all probability, this is a record which has not been equaled on any similar project carried on during winter operations in the State of Wisconsin. Much credit for this total daily output is due to the friendly cooperative spirit of rivalry that has been built up by Eric Larson, as pit foreman and some of the other men. A record of 300 yd. per day was set as a goal and the crew has been able to beat this record on two successive times.

The road leading from the bins at the foot of the hill has many short steep grades so that it was not possible for the teams to haul the big loads that

SPREADING SHALE ON SNOW COVERED ROAD

were at first anticipated on this job. The heavier sleighs were able to haul from 6 to 8 yd. of shale per load. The smaller sleighs, furnished by local farmers, were able to haul from 4 to 6 yd. A friendly spirit of rivalry has also been developed among the farmers and teamsters to see who can haul the biggest load. The record load at Merrillan, Wisconsin, was hauled by Fred Cooper of Merrillan, Wis., who hauled 16 yards with one team for a distance of 2½ miles. The team weighed not to exceed 2300 lb.

DIGGING SHALE ON SPARTA-TOMAH JOB

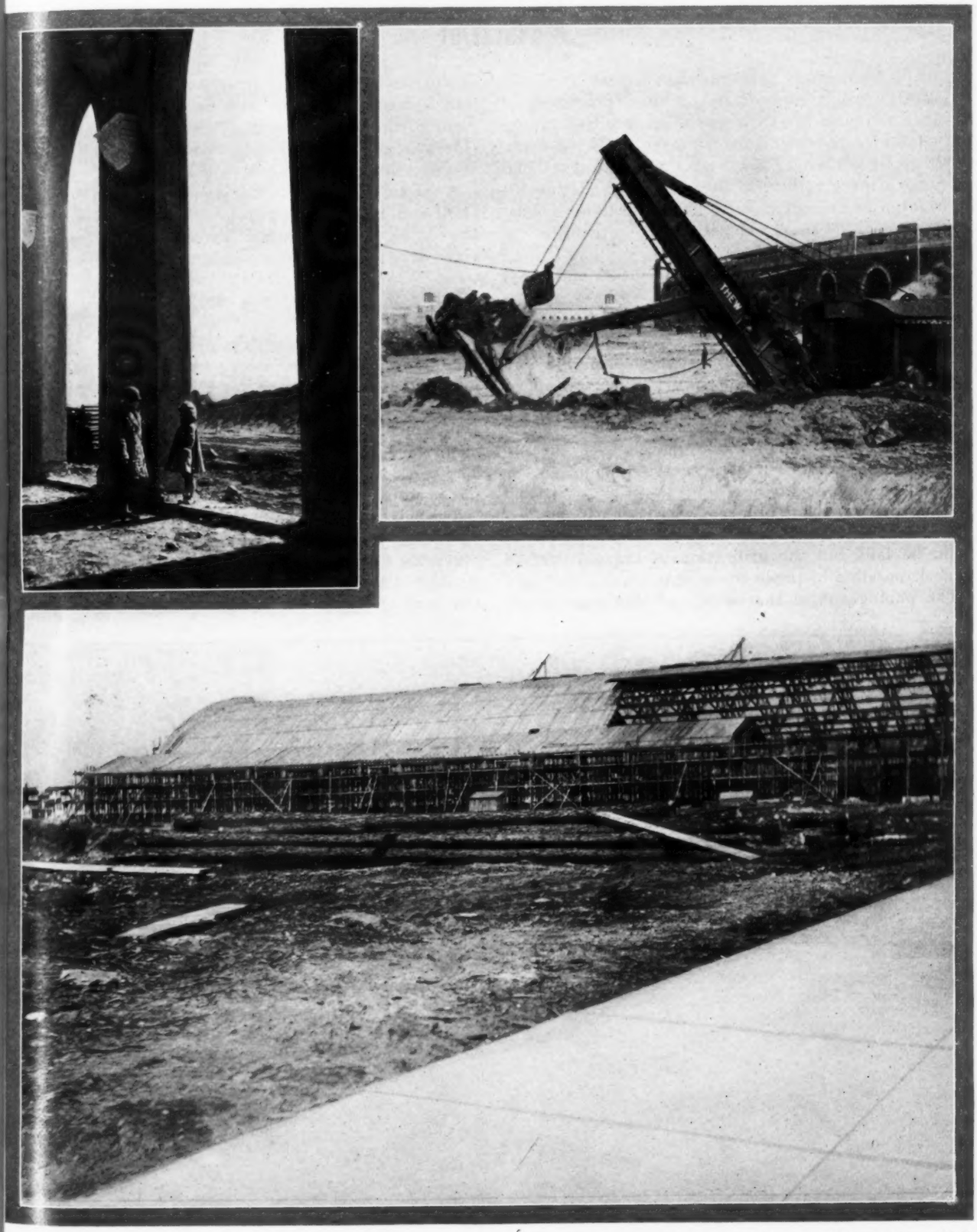
The shale pit at Tomah is so situated that it is possible to build a road directly up the side of the hill into the pit. Here a large gasoline shovel is used in digging, breaking up and loading the shale after it is first shot from the face of the pit with dynamite. The empty sleighs are driven directly into the shale pit over a prepared snow road, are loaded by the shovel and then pulled out of the pit with a snap team. One-half of the track leading down the hill is kept covered with hay and sand in order to hold the loads back as they go down the steep grade to the main highway below. At the foot of the hill, the snap team is unhitched and the other team is then able to pull the load along the highway to where the shale is dumped and spread on the road by another crew.

On account of the sandy soil and scarcity of teams, considerable difficulties have been experienced from time to time with poor sleighing conditions so that it was not possible for Mr. Isaacson, on this job, to make the record daily outputs that were obtained on the Merrillan job. In all probability, however, a world's record has been established by Mr. Isaacson on the Sparta-Tomah job. On Feb. 15, a load of 18.4 yd. of shale weighing approximately 20 tons was hauled by Hugh Kelley and one team of horses, a distance of 1½ miles to the road. A second load of 16.2 yards, weighing 18 tons, was hauled by E. Beaudette on the same day. The boxes were prepared and loaded by Martin Isaacson, shovel foreman, and the whole work supervised by V. Isaacson, superintendent. One of the photographs gives a very good idea of the size of these loads. They resemble very much the old time loads of logs that used to be loaded by Andy McClusky and some of the wonderful old time logging foremen. Like Andy McClusky's load of logs for the I. K. Keer Company, Vic Isaacson's load of shale for the A. Larson & Company is a record that ought to go down in history. The entire work was carried on under the engineering supervision of L. R. Gage, resident engineer of the La Crosse office of the Wisconsin Highway Commission.

On account of the unusual fine winter weather that has prevailed and the able manner in which the work has been carried on and supervised, the shaling was completed before the end of February.

THE RECORD LOADS ON THE LARSON COMPANY'S JOBS

Getting Ready for the Sesqui-Centennial



These three photographs were taken a few days ago on the site of the Sesqui-Centennial Exposition in Philadelphia, which will be opened at the end of May. The large building in the lower photograph is one of the biggest buildings on the grounds. © D. Day.

OLD MACADAM PAVEMENTS UTILIZED AS BASE FOR NEW ASPHALT SURFACE

Wisconsin Municipality Extends Its Paving Program by Judicious Use of Old Material

EVERY community large or small faces a considerable yearly expenditure for the replacement of wornout pavements. In a great many cities in the United States pavements which were designed for a fairly small volume of horse-drawn traffic have been carrying a large volume of automobile traffic, including a large number of heavy trucks, and it is surprising that some of these old pavements have lasted as long as they have.

Naturally in planning for new pavements municipal officials always are anxious to utilize as much as possible of the pavement already down and the photographs which accompany this article show how Rhinelander, Wis., has been handling its pavement reconstruction problem. Rhinelander, with a population of about 7000, resurfaced about 90,000 sq. yd. of its streets with Texaco asphalt last year and on nearly all of the streets which were repaved used the old macadam and gravel surfaces as the foundation for the modern asphalt paving.

When the pavement program was begun it was expected that only about 30,000 sq. yd. of new pavement could be laid, but the utilization of the old surface made it possible to triple the quota.

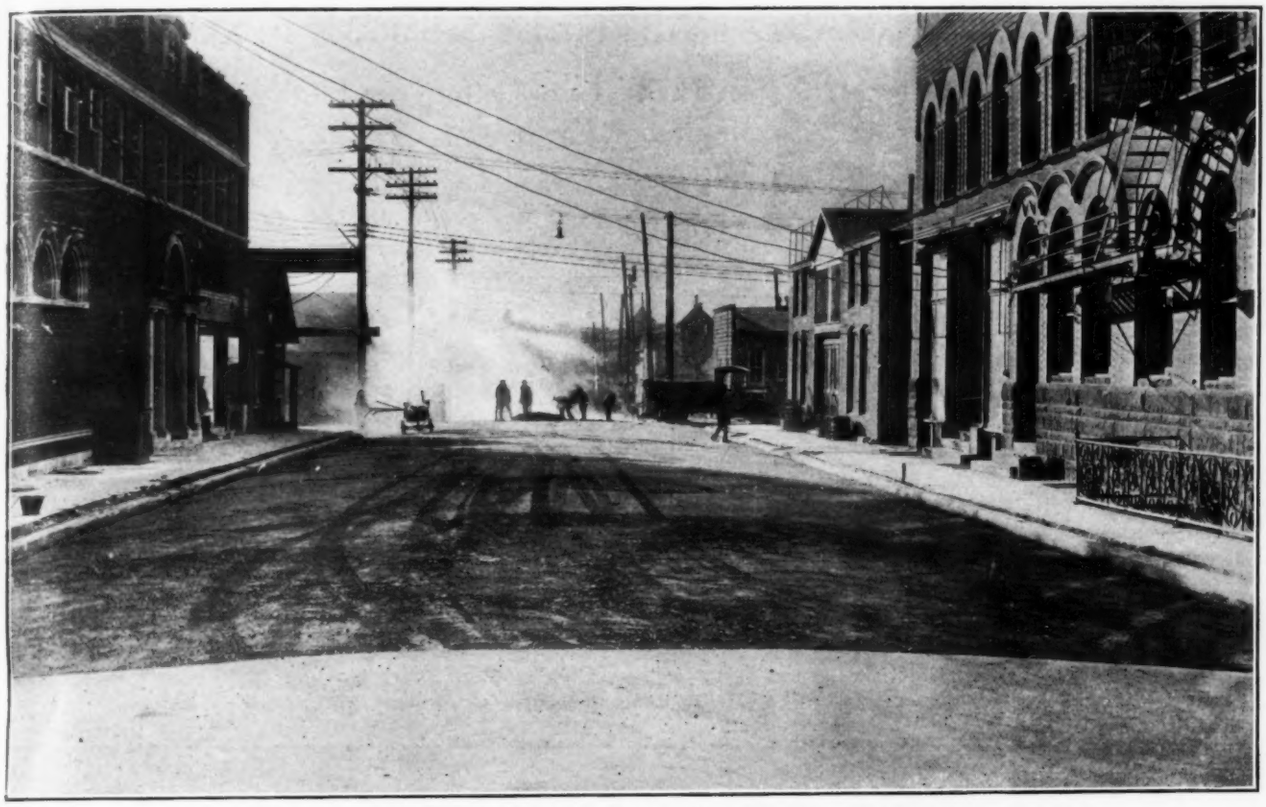
The photograph at the bottom of this page shows one of the old macadam streets in Rhinelander which was widened before the new pavement was laid. On many of the streets it was necessary to remove a considerable amount of gravel in order to develop a proper cross section for the resurfacing.

A mixture of asphalt and stone was then employed to fill all holes and irregularities still remaining in the old surface. In every case test holes were dug to make sure that there was a substantial depth of gravel to act as a foundation for the asphalt.

After this stage of the work was completed the asphalt binder course, 1½ in. in thickness, was spread and rolled. On top of this a sheet asphalt top course was laid also 1½ in. thick. As soon as the sheet asphalt course was spread and rolled the new pavement was ready for use. The results obtained during 1925 in Rhinelander were so satisfactory that it has been decided to resurface 50,000 sq. yd. more during 1926. The work was carried on last fall until cold weather put a stop to it.

The plans and specifications for the asphalt resurfacing were prepared by the Jerry Donohue Engineering Company of Sheboygan, Wis. The Bridges Asphalt Paving Company of Marion, Ind., handled the work of laying the asphalt. This work, of course,

GETTING OLD MACADAM PAVEMENT READY FOR RESURFACING WITH ASPHALT. THIS STREET WAS WIDENED



BINDER COURSE IN PLACE READY FOR SHEET ASPHALT TOP

was done under the supervision of a testing laboratory.

Work on the extended paving program will be begun as soon as the weather permits and will be pushed as rapidly as possible. The municipal officials of Rhinelander are anxious to complete their reconstruction program with the least possible delay.

ROLLING SHEET ASPHALT WEARING SURFACE ON STREET SHOWN ON OPPOSITE PAGE. PART OF BINDER COURSE IN FOREGROUND

WIRE ROPE GUARD RAIL KEEPS ICE OFF ROADS

Pennsylvania Finds New Use for Protective Fence on Highway Beside the Allegheny River

THAT there is more than one use for highway guard rail has been the welcome discovery made during the last few weeks by the Pennsylvania Highway Department. The newspapers throughout the country have devoted columns of space to the damage wrought by the ice gorges in the Allegheny River and the numerous attempts made to free the ice in the center of the stream. The photograph at the bottom of this page was taken on Pennsylvania State Highway Route 91, which follows the bank of the Allegheny between Franklin and Oil City in Venango County. It shows the ice piled high in the river and spreading out on the bank until stopped by the guard rail, a use of the guard rail not even considered when it was put up.

Before the Pennsylvania Highway Department adopted the present standard of guard rail, exhaustive experiments were carried on both in the laboratory and under actual field conditions to determine the best type to use. The type adopted, which has so signally proved its usefulness in holding back the ice along the Allegheny, consists of standard three strand galvanized steel rope containing twenty-one wires. The posts must be made of seasoned chestnut, locust or red cedar, at no place less than six inches in diameter or six inches square. Both round and square posts must not be used on the same stretch of rail. All posts are creosoted before being set up.

The eyebolts are galvanized and are one inch in diameter with galvanized cast iron washers and nuts attached. On sections of fence more than 200 ft. in length four 24 in. by 1 in. eyebolts, nuts and washers threaded for 18 in. must be used. On shorter sections eyebolts threaded for 6 in. may be used.

The posts are 7 ft. in length with half their length below the surface. A concrete dead man, through which is an eyebar 4 ft. in length, is used at the end of each section. This deadman must have a face of not less than 4 sq. ft. and must be 6 in. thick.

STANDARD PENNSYLVANIA GUARD RAIL HOLDING BACK ICE ON BANK OF ALLEGHENY RIVER